

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
9 June 2005 (09.06.2005)

PCT

(10) International Publication Number  
**WO 2005/052641 A3**

(51) International Patent Classification<sup>7</sup>: G02B 6/00,  
HO1L 21/00, G03F 7/004, 7/075

(74) Agent: MORI, Masayasu; Oblon, Spivak, McClelland,  
Maier & Neustadt, RC, 1940 Duke Street, Alexandria, VA  
22314 (US).

(21) International Application Number:  
PCT/US2004/037188

(22) International Filing Date:  
22 November 2004 (22.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/523,978 21 November 2003 (21.11.2003) US  
60/585,235 2 July 2004 (02.07.2004) US

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,  
SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- with amended claims

(88) Date of publication of the international search report:  
30 March 2006

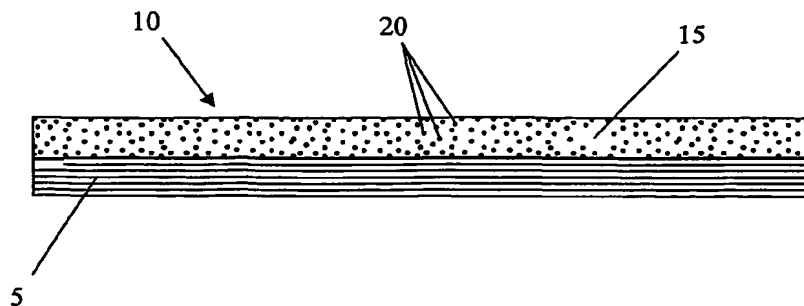
Date of publication of the amended claims: 18 May 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicants and

(72) Inventors: **CHOKI, Koji** [JP/JP]; 3-17-16-508  
Sakura, Setagaya, Tokyo 156-0053 (JP). **MORI, Tetsuya** [JP/JP]; 4-13-2-305 Saginuma Miyamae-ku, Kawasaki 216-0004 (JP). **RAVIKIRAN, Ramakrishna** [IN/US]; 9501 Cherry Tree Drive, #102, Strongsville, OH 44136 (US). **FUJIWARA, Makoto** [JP/JP]; 12-2-201 Honmura-cho Asahi-ku, Yokohama-shi, Kanagawa 241-0024 (JP). **TAKAHAMA, Keizo** [JP/JP]; 3-8-12-510 Kowada, Chigasaki 253-0012 (JP). **WATANABE, Kei** [JP/JP]; 1-466-1-504 Marukodoori Nakahara-ku, Kawasaki 211-0006 (JP). **NONAKA, Hirotaka** [JP/JP]; 817-15-N315 Ogura Saiwai-ku, Kawasaki 212-0054 (JP). **OTAKE, Yumiko** [JP/JP]; 2-1-30-405 Nagatakit Minami-ku, Yokohama 232-0071 (JP). **BELL, Andrew** [GB/US]; 1511 Lewis Drive, Lakewood, OH 44107 (US). **RHODES, Larry** [US/US]; 3036 Vincent Road, Silver Lake, OH 44224 (US). **AMOROSO, Dino** [CA/US]; 5746 Rosemont Way, Medina, OH 44256 (US). **MAT-SUYAMA, Mutsuhiro** [JP/JP]; 817-15-N314 Ogura, Saiwai-ku, Kawasaki 212-0054 (JP).

(54) Title: OPTICAL WAVEGUIDES AND METHODS THEREOF



(57) Abstract: Embodiments in accordance with the present invention provide waveguide structures and methods of forming such structures where core and laterally adjacent cladding regions are defined. Some embodiments of the present invention provide waveguide structures where core regions are collectively surrounded by laterally adjacent cladding regions and cladding layers and methods of forming such structures.

WO 2005/052641 A3